INTERSTATE COMMISSION ON THE POTOMAC RIVER BASIN

FY2014-2015 SECTION 106

POTOMAC BASIN WATER QUALITY IMPROVEMENT

FINAL REPORT

October 24, 2014

This is an ongoing program. The nature of the scope of work for the use or generation of environmental data is similar to work completed in previous grants and has an approved QMP. The accomplished tasks • support development of TMDLs, • enhance water quality restoration and protection on a watershed basis, • improve drinking water source area protections, • help develop and maintain adequate monitoring and assessment measures, and • foster greater involvement of informed citizens.

GRANT COORDINATOR

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Goal: (2) Clean and Safe Water | **Objective:** (2.2) Protect Water Quality | **Program Result Code:** 202B06

Work Plan Component: Water Quality Assessment | **EPA Contact:** Michael Hoffman | **ICPRB Contact:** Claire Buchanan (301) 274-8112

Environmental Outcomes	Measures	Outputs (Work Products and Activities)	Status / Comment
Enhanced water quality restoration and protection through watershed based, inter-agency efforts.	Grant management Adherence to ICPRB QMP Participation in & contributions to inter-agency initiatives Availability of ICPRB products	*Work Products:* 1. Quarterly progress reports to EPA and to the ICPRB Commission with description of specific activities and their contributions to the states' water quality protection efforts. 2. Submit EPA Form 5700-52A, MBE/WBE Report, for FY2013 by Oct 31, 2013. 3. Submit Financial Status Report for FY2013 by December 31, 2013. 4. Submit an application for the FY2015 Section 106 grant by July 31, 2014. 5. Improved access to Commission resources and products *Activities:* 1. Management of this grant 2. Implement QA/QC as required by ICPRB Quality Management Plan 3. Participate in and contribute to inter-agency water quality initiatives: ◦ EPA Region III Water Directors meetings ◦ Upper Potomac tributary team ◦ EPA Chesapeake Bay Program workgroups and implementation teams ◦ Maryland Water Monitoring Council ◦ Association of Mid-Atlantic Aquatic Biologists ◦ Anacostia Watershed Restoration Alliance, Anacostia Restoration Potential Workgroup, Anacostia Watershed Citizen's Advisory Council, and Anacostia Watershed Management Committee ◦ Inter-agency and / or watershed based groups focused on water quality problems ◦ Trash Free Potomac Watershed Initiative ◦ Virginia James River Study Science Advisory Panel 4. Improve management and availability of Commission resources; enhance communication of Commission scientific studies through non-technical, online summaries	Progress reports were submitted. EPA Form 5700-52A and MBE/WBE Report for FY2013 were submitted on time. Staff participated in national and regional meetings, and contributed to a broad range of workgroup, workshop and advisory panel activities. Procedures for making ICPRB technical studies more readily available have been implemented. Update and expansion of ICPRB website is underway. Launch is planned for end of December 2014. A QAPP for Task 8 (develop filamentous algae methods for Virginia Shenandoah River) was submitted. ICPRB QMP was updated Feb 2014 and submitted to EPA3.

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Work Plan Component: Water Quality Assessment | **EPA Contact:** Michael Hoffman | **ICPRB Contact:** Heidi Moltz, (301) 274-8116

Environmental Outcomes	Measures	Outputs (Work Products and Activities)	Status / Comment
Improved protection of drinking water source areas via coordinated inter-agency efforts (regionally and nationally) to restore and protect water quality.	Completed activities Data sets Reports Blog	*Work Products:* 1. Spill drill (FY14 date TBD) 2. Report (Activity 4), due Sept 30, 2014 ○ describes existing state water quality and associated water use data sets, including how to obtain data ○ objective: assist Potomac basin states in understanding and prioritizing water quality issues of interstate significance to protecting safe drinking water 3. Report (Activity 5), due Sept 30, 2015 ○ describes influence of impervious cover under various watershed conditions ○ objective: inform activities in the basin involving source water protection and integrated water resources management 4. Marsh and Rock creek blog (http://www.marshrockwaterplan.blogspot.com/) *Activities:* 1. Participate in, contribute to, and/or provide technical assistance to the following groups, to promote integrated water resources management in the Potomac and the US: ○ Pennsylvania Statewide Water Resources Committee ○ Pennsylvania Potomac Regional Water Resources Committee ○ Adams County (PA) Water Resources Advisory Committee ○ ICWP ○ ACWA ○ other groups involved in local and interstate safe drinking water / water quality issues 2. Promote interest in the Potomac Basin-Wide Comprehensive Water Resources Plan 3. Conduct "spill drills" ○ coordinate with utilities and government agencies ○ test proficiency in emergency notification during actual spill events	*Outputs* 1. Complete 2. Complete, report available online at: http://www.potomacriver.org/publications pdf/ICP14-2_Moltz.pdf 3. In progress, final report expected at the end of FY15. 4. Ongoing *Activities* 1. Ongoing 2. Ongoing 3. Internal, ICPRB spill exercise completed. Maintained spill model spreadsheet and contact information for basin utilities and government agencies. 4. Report complete and available online at: 5. Detailed scope of work developed, technical work initiated 6. Ongoing periodic blog updates

		○ maintain communication database and improve the spill model as necessary 4. Complete report on the data inventory describing existing state water quality and water use data sets ○ spreadsheet of water quality data sources ○ description of data sources and how to obtain data ○ discussion of how data can be used ○ identify gaps in inventory 5. Perform data analysis of impervious surface effects ○ builds on previous work identifying effects of >0.35% impervious cover ○ further assesses these impacts in the Potomac basin in different physiographic provinces, geologies, precipitation regimes, and other important physical characteristics ○ objective: inform source water protection and integrated water resources management activities in the basin 6. Maintain Marsh and Rock creek blog (www.marshrockwaterplan.blogspot.com/)	

Task 3: Assistance to Potomac jurisdictions' monitoring strategies

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Work Plan Component: Water Quality Monitoring **EPA Contact:** Michael Hoffman **ICPRB Contact:** Jim Cummins (301) 274-8106

Environmental Outcomes	Measures	Outputs (Work Products and Activities)	Status / Comment
Increased percentages of large river and streams assessed for 305(b) reporting.	Completed activities Data sets Reports	*Work Products:* 1. Full reports (Activity 1) provided to the states and to the EPA by March 31, 2014 (2013 results), March 31, 2015 (2014 results). 2. 1-day meeting in Feb-Mar 2014 *Activities:* 1. Large river assessments: see attached "Narrative support for ICPRB FY 2014-15 Section 106 Monitoring Initiative Funds" ○ FY 14 and FY15 surveys at three large river stations in the Potomac River's mainstem, using a modified version of EPA's non-wadeable streams protocols. ○ Survey includes water quality parameters (temperature, pH, conductivity, turbidity, alkalinity) large-river habitat characterizations and biological components, principally benthic macro-invertebrates and submerged aquatic vegetation with augmented freshwater mussel components. 2. Convene a 1-day meeting in Feb-Mar 2014 to reevaluate the low flow and baseline monitoring strategy for the Potomac mainstem (esp. Little Falls) - field and lab methods, contingency plans, and results. Assemble relevant, recently available data for the Potomac mainstem.	Completed 2013 annual report will be made available soon on www.potomacriver.org. Data collected in 2013 are available on request. Completed 2014 field assessments, currently preparing benthic samples for laboratory identifications and computer entering data. Assisted EPA and Mont. Co., MD developing a Northern Piedmont Biological Condition Gradient. Workshop postponed.

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Work Plan Component: Water Quality Assessment | **EPA Contact:** Michael Hoffman | **ICPRB Contact:** Claire Buchanan (301) 274-8112

Environmental Outcomes	Measures	Outputs (Work Products and Activities)	Status / Comment
Enhanced water quality assessment, restoration and protection through watershed based, inter-agency efforts.	Completed activities Publications Reports	*Work Products:* 1. At least two papers submitted for publication in peer-reviewed journals (Activity 1), by Sept 30, 2014; remaining papers submitted by Sept 30, 2015 2. Updated and expanded technical information on ICPRB website (Activity 2), by Sept 30, 2015 *Activities:* 1. Publishing in peer-reviewed journals provides a rigorous critique of ICPRB methods and results, broader dissemination of the results, and eventually a scientifically defensible base of knowledge to inform policy and decision-making. ICPRB proposes to complete and submit papers describing the results of recent investigations, specifically: o The identification of nutrient thresholds for macroinvertebrates that are protective of high quality streams and rivers in Mid-Atlantic states. FY2014 o Feasibility of Walker's predictive model relating mean chlorophyll a to the frequency of algal blooms in large Mid-Atlantic rivers. FY2014 o Development of a basin-wide benthic index of biotic integrity for non-tidal streams and wadeable rivers in the Chesapeake Bay watershed. FY2015 o Synthesis of previous analyses linking watershed characteristics to observed and modeled flow statistics, and identification of primary factors causing flow alteration in the Potomac watershed. FY 2015 o Development of a multi-variable index of tidal shallow water quality derived from near-continuous monitoring data (pH, DO, turbidity, Chl-a) using state water quality criteria/thresholds. FY2014 2. Update and expand ICPRB's "Potomac Integrative Analysis Online Collection" and other sections of ICPRB website with o Interactive graphics of Potomac data o Links to scientific studies, presentations, and data analyses o Maps showing health of streams, rivers, and estuary	Journal publication supported by this grant: • Buchanan *et al.* (2013) A test of the Ecological Limits of Hydrologic Alteration (ELOHA) method for determining environmental flows in the Potomac River Basin, U.S.A. *Freshwater Biology* 58(12):2632-2647. Draft manuscripts in preparation: • An index of phytoplankton habitat conditions in estuarine open waters • Statistical relationship between mean chlorophyll a concentrations and criteria exceedance rates (Walker relationships) Efforts were redirected during the year to support completion of two ICPRB reports: • Buchanan, C. 2014. Biological Reference Curves for Assessing the James River Chlorophyll *a* Criteria. ICPRB report 14-3. Available online at: http://www.potomacriver.org/publications pdf/ICP14-3_Buchanan.pdf • Buchanan, C. and R. Mandel. 2014. Water Quality Trend Analysis at 26 West Virginia Long-Term Monitoring Sites. ICPRB report 14-6. Interstate Commission on the Potomac River Basin. Available on request. Update and expansion of ICPRB website is underway. Launch is planned for end of December 2014.

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Work Plan Component: Water Quality Assessment | **EPA Contact:** Michael Hoffman | **ICPRB Contact:** Jim Cummins (301) 274-8106

Environmental Outcomes	Measures	Outputs (Work Products and Activities)	Status / Comment
Enhanced water quality restoration and protection through watershed based, inter-agency efforts.	Completed activities Reports	*Work Products:* 1. Reports (Activity 1, 2) to EPA and the states by Dec 31, 2014 and Dec 31, 2015. 2. Annual update of ICPRB status of Potomac American shad population on ICPRB website by Dec 31, 2014 and Dec 31, 2015. *Activities:* 1. Perform FY2014 and FY2015 spring field survey of adult American Shad in the upper tidal Potomac and collect eggs for hatchery. 2. Relate Potomac shad population trends with Potomac River and Chesapeake Bay restoration efforts. 3. Provide input to the CBP shad indicator when requested.	Completed 2013 annual report, available online at: http://www.potomacriver.org/publicationspdf/ICP13-11_Cummins.pdf Conducted 2014 field collections with linked educational and volunteer components. Co-chaired EPA Chesapeake Bay Program workgroup responsible for developing a new Bay-wide American shad indicator.

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Work Plan Component: TMDL **EPA Contact:** Michael Hoffman **ICPRB Contact:** Ross Mandel (301) 274-8118

Environmental Outcomes	Measures	Outputs (Work Products and Activities)	Status / Comment
Increasing stream miles that meet WQ standards	Completed activities Technical memos and reports	*Work Products:* 1. Memos documenting significant tasks performed, as requested, in support of jurisdiction TMDL programs or other regulatory programs such as the MS4 program. Submitted as requested. 2. Tech memos documenting evaluation and/or adaption of computer simulation models to water quality problems in the Potomac River basin (Activity 3). Due Sept 30, 2014; Sept 30, 2015 3. Literature survey on BMP reduction efficiencies for pathogens and indicator bacteria. Due Sept 30, 2015 *Activities:* 1. Provide technical assistance, on request, to basin jurisdictions in addressing TMDL-related issues. 2. Provide technical review of MS4 permits or other regulatory or programmatic documentation, on request of basin jurisdictions. 3. Analyze computer simulation models for potential application to TMDLs and water quality problems. 4. Explore methods for developing implementation plans which address TMDLs for multiple constituents and in particular, review how methods to control bacteria can be related to nutrient and sediment reduction. 5. Expand investigations of Walker-type relationships between mean Chl a and frequency of algal blooms in other rivers, for the purpose of identifying river mainstems that are more (or less) susceptible to algal blooms. 6. ICPRB will review and comment on any toxic monitoring plan in DC waters developed by EPA or its contractors. Upon EPA's request, ICPRB will review and comment on data collected as a result of the monitoring program.	*Outputs:* 1. Documentation of spreadsheet model of bacteria at Fairview Beach VA in support of Fairview Beach Watershed Plan; preliminary memo for MDE on approaches to pH impairments caused by acid deposition; comments on DC Consolidated Implementation Plan Draft Methodology Report and Baseline Load Report. 2. Memo on Prospect for Simulating TOC in Potomac River Basin using CBP Phase 5 Watershed Model. 3. Ongoing. *Activities* 1. Development of spreadsheet model of bacteria at Fairview Beach VA in support of Fairview Beach Watershed Plan. 2. Participation in Stakeholder's Committee for review of development of District of Columbia Consolidated Implementation Plan. 3. Analyzed CBP Watershed Model for use in simulating TOC in Potomac River Basin for Potomac River Drinking Water Partnership. 4. Investigated CAST/MAST/VAST for use in bacteria TMDL implementation; literature review of urban BMP efficiency rates for bacteria reduction. 5. Walker-type relationships between mean Chla and frequency of algal blooms could not be determined for other rivers due to a lack of data. Data analysis shows they occur in tidal waters of Chesapeake Bay. The Walker-type relationships for the Bay are included in a report to VADEQ. 6. Not requested.

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Work Plan Component: Water Quality Assessment | **EPA Contact:** Michael Hoffman | **ICPRB Contact:** Curtis Dalpra (301) 274-8107

Environmental Outcomes	Measures	Outputs (Work Products and Activities)	Status / Comment
Enhanced water quality restoration and protection through greater involvement of informed citizens.	Complete activities and media products Website Workshops	*Work Products:* 1. Four issues of the *Potomac Basin Reporter* per year 2. Production of press releases and other efforts to grow media and public attention to Potomac issues. 3. Respond to approximately 35 information requests per week from the public, educators, students, and state / federal / and local environmental agency staff. 4. Produce weekly Potomac public service announcements from Memorial Day to Labor Day. 5. Up to date information about Potomac water issues on www.potomacriver.org 6. 4-8 presentations to watershed or other groups during the year on various Potomac water quality/resources issues. 7. Maintain ICPRB library for public research purposes. 8. Build and participate in coalitions of local governments and citizen groups for stream restoration projects 9. Potomac newsclip service delivered to public weekly 10. Quarterly progress reports to EPA and to the ICPRB Commission *Activities:* 1. Help organize and participate in annual Chesapeake Watershed Forum 2. Promote public involvement and stewardship, and educate the public on Potomac basin issues, using various tools, including ○ producing newsletters/other publications, ○ maintaining an active website and social media sites, ○ providing direct support for watershed organizations (organizational, administrative, and scientific support), ○ producing press releases and using other methods to bring Potomac issues to public attention through the media, and through presentations at public meetings.	*Media:* Emphasis was placed on reconfiguring, upgrading, and updating content on ICPRB's website at the expense of producing four issues of the *Potomac Basin Reporter*. The new website is one way ICPRB will improve the availability of Commission resources and enhance communication of Commission scientific studies. Launch of new website is planned for the end of December 2014. ICPRB staff produced weekly summer service announcements ("Potomac Watch") and the weekly newsclip service ("Potomac River News Reservoir"). Staff made presentations to Potomac Watershed Round Table about the ICPRB COOP climate change study. Effort made to start citizen reporting of invasive water chestnut found in tidal fresh Potomac this year. Press and social media releases about meetings, events, etc. *Workshops:* ICPRB is providing teacher professional development workshops through partnerships with county organizations and school systems. The workshops provide student lesson plans that meet requirements for environmental literacy, core curriculum, and other standards. Teachers and students gain a new understanding of the relationships between land use and water quality. Activities in the lesson plans include making stream habitat observations, collecting and evaluating macroinvertebrate samples, and planning/installing best management practices on school campuses. Workshops reached more than 80 teachers and watershed group members, who then used the information to teach their students and colleagues.

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Environmental Outcomes	Measures	Outputs (Work Products and Activities)	Status / Comment
Increased percentages of large river and streams assessed for 305(b) reporting.	Completed activities Progress reports	*Work Products:* 1. Quarterly progress reports to EPA and to the ICPRB Commission 2. End of year report to EPA *Activities:* 1. Develop a field assessment methodology for filamentous algae in Virginia waters, to assist VADEQ in evaluating the impacts of filamentous algae on recreational uses of state waters. Methodology and data collection will be piloted in the Shenandoah River Basin. In addition to data collection and methodology development, ICPRB will coordinate data entry and management and draft a final report summarizing methodology and survey results.	Updates routinely emailed to USEPA and VADEQ. End of year progress report is completed.